

NOTES.

Two letters which have passed between Sir William Anson and Lord George Hamilton, with reference to the recent dismissals at Coopers Hill College, appeared in Wednesday's *Times*. Sir William Anson stated briefly the chief points upon which the request for an inquiry into the case is based. Accepting the decision that some change in the course of studies is necessary, it is urged that (1) the men affected by the proposed changes should have had an opportunity of a hearing when the president recast the course of studies, if only to see whether they would be willing to adapt themselves to the new conditions; (2) when the Board of Visitors considered, and in the main adopted, Colonel Ottley's recommendations, it does not seem to have been suggested to them that the teaching staff had not been consulted, or that they might have been consulted with advantage, or, at any rate, that the gentlemen whose dismissals were in contemplation had a right to be heard; (3) many persons eminent in science have expressed a strong opinion that the proposed dismissals will act injuriously on the scientific education of the country. In reply to Sir William Anson, Lord George Hamilton states that he has already taken steps to meet some of the complaints, and to put the teaching staff of the College upon a better footing. Upon his request the Board of Visitors have stated their readiness to meet to hear at once what the members of the teaching staff affected by the changes may wish to urge against them. In conclusion, Lord George Hamilton acknowledges that the channels of communication between those actually teaching and those in authority over the teachers—viz., the president and visitors—should be widened and quickened, and that a divergence of opinion such as has been revealed is detrimental, if not fatal, to harmonious co-operation. He adds, "I therefore propose to ask the Universities of Oxford, Cambridge and London to each nominate a visitor to be an addition to the present board. I shall ask the board, when so reconstituted, to appoint a committee, including the above, to inquire and report upon the working, discipline and constitution of the College, and the relations of the visitors, president and teaching staff."

THE Croonian Lecture of the Royal Society will be delivered on March 21 by Prof. C. Lloyd Morgan, F.R.S., on "Studies in Visual Sensation."

PROF. J. J. THOMSON, F.R.S., has been elected a member of the Athenæum Club under the provisions of the rule which empowers the annual election by the committee of nine persons of "distinguished eminence in science, literature, the arts, or for public services."

PROF. VON WETTSTEIN has been elected president of the Zoological-Botanical Society of Vienna.

THE Imperial Academy of Sciences of Vienna has inaugurated a botanical exploration of southern Brazil during the present year, under the leadership of Prof. von Wettstein and Prof. V. Schiffner.

WE learn from *Science* that the expedition sent by the U.S. Naval Observatory to observe the forthcoming solar eclipse was expected to leave San Francisco for Manila on February 16. From Manila it will be transported to Sumatra by a U.S. warship, and headquarters will be established at Padang about a month before the occurrence of the eclipse. The party includes Prof. Skinner, of the U.S. Naval Observatory, Prof. Barnard, of the Yerkes Observatory, Dr. Mitchell, of Columbia University, Dr. Humphreys, of the University of Virginia, and Mr. Jewell, of the Johns Hopkins University.

THE death is announced of Mr. John Hopwood Blake, F.G.S. Trained as an engineer under Brereton, he became an associate

member of the Institution of Civil Engineers. In 1868 he joined the staff of the Geological Survey, and did much field-work in Somerset, in Norfolk and Suffolk, and latterly in Berkshire, Buckinghamshire and Oxfordshire. He was the author of memoirs on the geology of Yarmouth and Lowestoft, and of East Dereham, and had in preparation memoirs on the geology of Reading and on the water supply of Berkshire. Though slow as a worker and diffident in expressing his opinions, the work which he accomplished was performed with much enthusiasm and with the most painstaking care and precision. He died at Oxford on March 5, of angina pectoris, at the age of fifty-seven.

AT the Pan-American Medical Congress, which met recently at Havana, the board which has been engaged in the investigation of yellow fever, consisting of Drs. Reed, Carroll and Agramonte, made a report. According to Press reports it was stated that two of the main conclusions were that the specific cause of the disease is unknown, and that it can be carried only by mosquitoes. The fever can be produced by a subcutaneous injection of blood from a patient who must have had the disease for not more than two days. Mosquitoes must also bite the patient during the first two days of his illness or they cannot transmit the disease. The board kept an infected mosquito for fifty-one days, when it was allowed to bite a person, who contracted the disease. The board differs from Dr. Finlay in that the latter holds that more than one kind of mosquito can convey yellow fever. The board says there is only one kind that can do so. Dr. Finlay also says that a mosquito can transmit the disease the fourth or fifth day after biting a patient, while the board says that twelve days must intervene. The board reported that non-immunes were allowed to sleep in infected clothing and bedding, but none contracted the disease. Dr. Wilde, of the Argentine Republic, proposed the creation of an international yellow fever board to study means of exterminating the disease.

THE Royal Irish Academy has this year taken a step, after prolonged consideration, which will, it is hoped, still further establish its position in Ireland, and in the world of science and letters in general. It has adopted the principle of the bye-laws of the Royal Society of London, respecting the mode of election of members; the council is now empowered to select a number of persons, not exceeding twelve, in each year, from the list of candidates for membership proposed, and to recommend these to the body of members for election. The members may, at the single annual meeting at which elections now take place, substitute the name of any candidate already proposed for that of any candidate selected by the council; but the number of candidates elected must not be greater than that fixed by the council for that particular year. Changes have been also made in the bye-laws so as to provide for the more frequent introduction of new blood into the council. The position of the Royal Irish Academy becomes at the same time defined in relation to the other great medium of scientific publication and intercourse in Dublin, the Royal Dublin Society. While the latter, by its objects and foundation, must be to a large extent a popular institution, performing its important public functions and scientific work by the support of an extensive body of members, the Royal Irish Academy is able, on the other hand, to maintain its membership as a distinction, and to attract to itself, by this circumstance, those who are mainly concerned with the furtherance of research. A large number of its members are naturally also members of the Royal Dublin Society, and thus enjoy the advantages offered by the publication-committees of both societies. With these two bodies in session, and with the *Irish Naturalist* as a medium for current notes, scientific work in Ireland need not wait long before receiving recognition and discussion.

A REPORT of a second lecture on wireless telegraphy, delivered by Prof. Braun at Strassburg, has been received. The first lecture was referred to in our issue of February 21 (p. 403), in which it was stated that we could not gather whether Prof. Braun had succeeded in obtaining a satisfactory separation of messages received at the same time from different sources. From the present lecture it appears that this difficulty has been overcome in Prof. Braun's system, as in Marconi's and Slaby's, by the use of syntony, which has been utilised, not only to separate different messages, but to augment the effect of the waves received in any particular message. No actual result of long distance trials is given in the report before us, but it is natural to suppose that Prof. Braun's system will succeed in this respect as have the other competing systems. It is interesting to note that all experimenters have been led to this method of separating messages; when wireless telegraphy first attracted attention it was suggested that messages might be confined to their particular destination either by the use of reflectors or by careful tuning of transmitter and receiver. Apparently only the second of these has proved practical; no doubt the long wavelength of the vibrations used have proved fatal to the satisfactory use of reflectors.

THE Board of Trade could not well have arrived at a more satisfactory decision in the conference which was held last week with reference to the proposal to reduce the charge for electric lighting by putting a maximum limit of 6*d.*, instead of 8*d.*, per unit in the provisional orders before Parliament this session. The proposal, which emanated from the Board of Trade, was supported by the London County Council but opposed by several influential electrical bodies, including the Institution of Electrical Engineers and the electrical section of the London Chamber of Commerce, on the ground that it would have the effect of discouraging electric lighting in small country places where the population was scattered. It was urged by Colonel Crompton, on behalf of the Institution of Electrical Engineers, that the advantages to be gained by reducing the maximum in every district would be outweighed by the disadvantage of preventing the spread of electricity all over the country. This is, however, no reason why the dwellers in towns should pay highly that their brethren in the country may enjoy the benefit of electric light, and the obvious solution is that the maximum price should be regulated by the circumstances of the case. This is the solution adopted by the Board; they would fix, said Sir Courtenay Boyle, a normal maximum of 7*d.* a unit, but in the populous districts they would endeavour to make this 6*d.*; in special cases an 8*d.* maximum would be allowed if the undertakers were able to show sufficient cause.

SEVERAL correspondents have written to us with reference to falls of snow or ice crystals such as have been mentioned already (pp. 420, 441). Prof. G. H. Bryan states that a fall of snow stars occurred at Edgbaston, Birmingham, on January 6, and a similar fall, in which the stars were somewhat larger, happened at Bangor on February 15. "In the latter case," he adds, "the crystals which fell in the morning were not sufficient in number to form a coating on the ground, but many of them remained unmelted during the afternoon in shady corners. A few days later isolated stars were again falling, and this time the rays were larger and more feathery." Dr. Abbot noticed a fall of snow crystals at Tunbridge Wells in February, and in connection with the subject he asks whether such crystals should be considered as (1) skeleton crystals, (2) twins, or (3) aggregates of very small hexagons. He remarks:—"What seems to me the most interesting question is the regularity of the angles and distances of the secondary branches; and if we are dealing with skeleton forms, are not ice crystals unique in having these?" Another correspondent says that during a fall

of snow crystals at Newcastle at the end of January or beginning of February last some of the crystals were about a quarter of an inch in diameter, and the outline was nearly circular.

SIR COURTENAY BOYLE objects, in the March number of *Macmillan's Magazine*, to many words in common use in science. His objections are partly etymological and partly to the vagueness of connotation of the words. Pliocene, miocene and phonolite are incorrectly formed; and the first two, together with palæozoic, mesozoic, kainozoic, jurassic and triassic are condemned because they are purely relative terms. Electron is objected to because there is sometimes a doubt whether it signifies a minute corpuscle having an electric charge or an electric charge without the corpuscle. Kion and autokion are suggested as preferable to the unsatisfactory words motor and the hybrid automotor.

THE U.S. *Monthly Weather Review* for November, 1900 (the last received) contains an interesting note of lightning from a cloudless sky, by Mr. C. E. Ashcraft, jun., of the Weather Bureau, Dominica. The phenomenon seems to be regarded in the States as one of rare occurrence, but in the West Indies it is frequently observed. The appearance of the flashes is that of sheet-lightning, and they do not seem to be confined to any particular quarter of the sky. The author considers that the theory of the exchange of electricities between vertical currents of air is a plausible explanation, as the phenomenon has always been observed in the evening, usually between seven and nine o'clock, at which time the colder currents of air are descending and setting up a vertical circulation, with steep gradients, and it is also at this time that the maximum electrification of the air occurs. Sometimes the sky is not absolutely clear, a few clouds hanging over the mountains to the east of the station, but the lightning will be seen far out to sea, where not the least vestige of cloud is visible. The flashes have been observed more frequently during the hurricane season. The phenomenon does not appear to be peculiar to the region of Dominica alone, but is said to have been observed in other parts of the tropics.

A NOVEL marine torch, in which acetylene gas is the illuminant, and of special design to ensure immediate ignition on being plunged into water, is described in *Fielden's Magazine*. The torch, it is stated, "simply consists of a plain cylinder of metal, sizes varying from 3 to 8 inches in diameter and from 1 to 5 feet in length. The cylinder, which is sealed at each end, contains in a wire basket a quantity of carbide of calcium and it also contains an air chamber to ensure sufficient buoyancy. At the head of the cylinder a number of burners is arranged adjacent to which is a small chamber containing calcium phosphide, which on contact with water generates phosphuretted hydrogen, ignites and also lights up the acetylene as it issues." The torch, which has no mechanism, is automatic throughout, the only precaution necessary before plunging into water being the removal of a protecting strip of metal by pulling a ring. The illuminating power of the torch can be gathered from the fact that a six-inch torch burns from an hour to an hour and a half with a candle-power of 2000 and a flame 12 inches high, and other torches which are rechargeable will burn from half an hour to ten hours according to size.

A FEW interesting instances of the application of physical instruments to the study of disease are given by Mr. Paget in a short review of the chief events in medicine and surgery between 1800 and 1850, in the *Middlesex Hospital Journal*. The chief influences which caused the great advance in the last ten years of that half century are stated by him to have been, first, the constant and general use of the microscope, both in physiology and pathology. Men left off speaking of tumours as "strange distempered masses"; they set to work to learn their minute

structure, and to interpret from it the clinical facts of each case. Next, the study of fevers, especially Sir William Jenner's observations on the essential difference between typhus and typhoid, and the improved treatment of fevers that was taught and practised by Graves of Dublin; he who said that he desired for an epitaph these words, "He fed fevers." Then, the invention of the ophthalmoscope by Helmholtz and the laryngoscope by Garcia, and the rise of special departments in hospital teaching, and of special work in practice. Next, the exact use of electricity in the diagnosis and treatment of nerve diseases, especially the work of Duchenne. The use of the thermometer followed, not invented all at once like the stethoscope, but very slowly established by years of work and millions of observations, especially the work of Wunderlich. Then the abolition of the old rough-and-ready methods of medical treatment, of useless bleeding and purging and low diet, and shameful abuse of mercury; and the knowledge of the selective action of drugs, especially the physiological study of such drugs as strychnine, curari, atropin and digitalis. Last of all, and best of all, the discovery of anæsthetics.

THE report of the Decimal Association records the progress made in the provision of instruction in the metric system of weights and measures, and the adoption of the system. By an article introduced into the code of elementary schools in 1900, instruction in the principles of the metric system, and in the advantages to be gained from uniformity in the method of forming multiples and submultiples of the unit, is made obligatory in the upper standards. Negotiations are in progress for bringing about a conference in Paris of official delegates and others, representing Great Britain, the United States and Russia, in favour of the adoption of the metric weights and measures in those countries. If this conference be held it will doubtless have important results. Active steps continue to be taken in the United States, and a bill for the introduction of the metric weights and measures in the State Departments is now before congress at Washington, and has been reported on favourably by the committee on coinage, weights and measures. The growth of public opinion in this country in favour of the metric weights and measures has attracted much attention in the United States, and has given an impetus to the movement there. In Canada, the Government are said to be seriously considering the adoption of the metric weights and measures, and several encouraging communications have been received by the Decimal Association from residents in that country. In Russia there is a growing disposition on the part of the Government to adopt the metric system, and there are good grounds for believing that an important step will be taken in that country shortly. In July last a report was issued by the Foreign Office which contained the replies of Her late Majesty's representatives in Europe to a circular addressed to them by the Marquis of Salisbury, asking for information as to the actual experience of nations which had adopted the metric system. The replies showed that in all cases the change was made without much difficulty, that there had never been any desire to return to the former system in use, and that the adoption of the metric system had assisted in the development of the trade of the countries which had adopted it. The second part of this report has just been published, and bears out these conclusions.

A SIMPLE elementary exposition of the principles of thermodynamics treated by means of the familiar p, v diagram is given by Mr. Robert H. Thurston in the *Journal* of the Franklin Institute, under the title "Elementary Graphics and Geometry of Thermodynamics."

IN the *Rendiconto* of the Naples Academy (January), Prof. Domenico de Francesco discusses certain problems in the dynamics of pseudospherical space. In a previous memoir the author

gave an investigation of "motion under no forces" for such space, and he here interprets for the same kind of space the differential equations which in ordinary space represent motion about a fixed point under arbitrary forces.

IN the ordinary theory of elasticity it is proved that when a body occupying a simply connected region is not acted on by either surface tractions or bodily forces the strain vanishes at every point of the interior. Nevertheless, bodies may exist in which internal tensions act; for example, we may imagine a split ring the ends of which do not meet, and suppose these ends brought into contact and welded together. In the *Atti dei Lincei*, x. 3, Signor G. Weingarten points out that in all such cases surfaces must exist at which the displacements are discontinuous, and he discusses the properties of such surfaces. The subject is an interesting one, but the paper is only a short note.

IN the *Journal* of the Franklin Institute, Mr. John Price Jackson discusses the use of electricity for coal mining. Electricity may be economically used for lighting, hoisting purposes, pumping, cutting, drilling, running fans, operating breakers or washers, propelling bucket or belt-lifts, driving repair shop apparatus, &c. The question as to whether any or all of these applications shall be used is dependent directly upon local conditions. If a system of mines owned by one company are supplied from a central power-house, it is clearly possible to entirely do without local steam plants at the individual mines. Such an arrangement has several advantages in the matter of economy of fuel, the very great economy in repairs and a still further economy in working speed efficiency.

Science Abstracts always contains statements of results of interest to all students of science, as well as descriptions of work of special value to those engaged in work in physics and electrical engineering. To the latter the periodical is invaluable, and it should find a permanent place in the library of every Technical Institute and School of Science, as well as in educational institutions of higher rank. Many subjects are described in the abstracts, which are concise, well arranged, and of real importance to workers in all branches of physical science. There is no better way of creating an interest in scientific work and arousing a spirit of emulation than by making students familiar with the progress of scientific knowledge.

THE *Irish Naturalist* for March contains an excellent account of the natural history of that comparatively rare visitor to the British coasts, the grey phalarope, by Mr. C. J. Patten.

IN the *Entomologist* for March, Mr. W. L. Distant describes two new species from West Africa of that remarkable genus of Heteroptera known as *Pephricus*, the members of which so curiously resemble crumpled and broken leaves. The genus is of especial interest as being one of the first in which "mimicry" was noticed, Sparman, who discovered the type species in 1775, mentioning his surprise on observing signs of active life in what he had taken for a dead leaf gnawed by caterpillars.

A HIGHLY suggestive and thoughtful paper on the question of the arboreal ancestry of marsupials and the mutual relations of the mammalian subclasses appears in the February number of the *American Naturalist*, by Mr. B. A. Bensley, who is now in this country studying marsupial ancestry. Taking as a text Dollo's view that marsupials were originally arboreal, that, on account of their foot-structure, they could not have been ancestors of placentals, and that they themselves are degenerate placentals, Mr. Bensley contrasts this with Huxley's scheme of mammalian evolution. According to the latter the Prototheria, which became specialised into the modern monotremes, gave

rise to the Metatheria, whose specialised representatives are the marsupials; while the Eutheria, specialised into modern placentals, are likewise an offshoot from the Metatheria. This phylogeny, thinks the author, is the most probable of all. It is urged that the imperfect placenta of the bandicoots, instead of being, as considered by Mr. Hill, vestigial, may be an instance of parallelism, and that in marsupials generally the allantois failed to form a placental connection. Owing to the antiquity of both placentals and marsupials, the arboreal character of the feet of the modern forms of the latter is of little importance. Further, it is considered that too much importance has been assigned to the characters distinguishing monotremes from other mammals; foetal marsupials showing a monotreme type of coracoid, while it is probable that in the long run it will be found impossible to maintain the essential dissimilarity between the milk-glands of monotremes and those of other mammals.

ANOTHER paper in the same issue of the *American Naturalist*, by Mr. A. E. Ortman, deals with the subject of the geographical distribution of animals and plants, its title being the "Theories of the Origin of the Antarctic Faunas and Floras." Sir Joseph Hooker first, and the late Dr. L. Rüttimeyer second, are credited with being the pioneers of the idea of the essential unity of the southern faunas. Rüttimeyer, indeed, distinctly states that "we should take a part of the present faunas of South America, South Africa and Australia for remnants of an old fauna that spread over a large extent of the Antarctic continent, and that this Antarctic continent was the centre of origin of a peculiar Antarctic fauna." Here it may be appropriately mentioned that Dr. Stejneger, in a paper in the same journal, feeling, like many other writers, the urgent want of a word denoting both fauna and flora collectively, proposes the term "Biota" to fill the gap. If this were adopted, he adds, "biotic" would then signify 'pertaining to or treating of a biota,' as, a biotic publication, a biotic region."

IN continuation of his earlier researches, Dr. Carl Sapper contributes a paper on the ethnography of southern Central America to the February number of *Petermann's Mitteilungen*. The paper gives an account of the languages of the region, with a map showing their distribution in 1899, and a comparative review of the civilisations of the different Indian tribes.

DR. EMIL SCHLAGINTWEIT returns to the question of the name of the highest mountain in the world in an article in the current number of *Petermann's Mitteilungen*. After discussing specially the Tibetan names Chomo Kankar and Tsering chenga, strictly Jomo gangs dkar and Thse ring mched lnga, Dr. Schlagintweit reasserts his former decision in favour of the name *Gaurisankar-Everest*.

THE *Verhandlungen* of the Berlin *Gesellschaft für Erdkunde* contains a paper on the geological history of the North German plain, by Prof. Wahnschaffe. An excellent summary is given of recent additions to our knowledge of the glacial phenomena of this region, especially those derived from deep borings. The *Zeitschrift* of the same society contains two important papers, one on the country and people of north-eastern Tibet, by Dr. K. Futterer, and a discussion of Dr. S. Passarge's observations of atmospheric pressure and temperature in the Lake Ngami region as applied to the determination of heights, by Herr G. von Elsner.

THE report of the Danish Meteorological Institute on the ice of the Arctic seas during 1900 has just been issued. With the support of the Seventh International Geographical Congress the Institute has been enabled to make this report fuller than in former years; not only is full information given from the Atlantic-Arctic waters, but a number of observations from the Bering and Beaufort Seas. The general features during the season were—great masses of ice in the north-west part of Barents Sea and round Spitsbergen, considerable masses of ice

in the Kara Sea, less ice than in a normal year between Franz Josef Land and Novaya Zemlya and under the east coast of Greenland, normal conditions off south-west Greenland, and particularly favourable conditions off Labrador and in Baffin's Bay.

In the third part of his "Geology of the Boston Basin," Mr. W. O. Crosby deals with "The Blue Hills Complex" (*Occasional Papers*, Boston Soc. Nat. Hist., 1900). This complex is the area of granitic rocks and associated Cambrian strata in eastern Massachusetts, which includes the Blue Hills and the country eastwards to Quincy and the northern parts of Braintree and Weymouth. In this region is the famous quarry which yielded *Paradoxides Harlani* of the Middle Cambrian, but the Lower Cambrian with *Olenellus* is likewise represented. No recognisable trace of the floor upon which the Cambrian strata were deposited has been discovered, but that Upper Cambrian or Potsdam strata exist, or formerly existed, in the region is evidenced by fossiliferous pebbles in the Carboniferous rocks, which, together with drift deposits, occupy much of the ground. The Cambrian strata were strongly folded and invaded by great bodies of igneous rocks not later than Devonian times. All these rocks and the effects of metamorphism are fully described and illustrated. The author also discusses the relations of the Blue Hills complex to the peneplains of eastern Massachusetts, and to the Glacial phenomena of the area. The palæontology of the Cambrian strata is dealt with by Mr. A. W. Grabau, and the leading fossils are figured.

A NEW part of the revised second edition of Prof. Arnold Lang's "Lehrbuch der vergleichenden Anatomie der wirbellosen Thiere," dealing with the Protozoa, has been received from the publisher, Mr. Gustav Fischer, Jena. The book has been completely revised and partly rewritten.

THE *Monist* for January contains the translation of an address, by Prof. Ludwig Boltzmann, on "The Recent Development of Method in Theoretical Physics." This address was originally delivered at the congress of the Gesellschaft deutscher Naturforscher und Aerzte in Munich in September 1899.

A NEW meteorological journal has been established under the title *Climate*, with Mr. N. A. Demchinsky as editor. The periodical will appear twice a month, and all its contents will be in four languages—Russian, German, French and English. The chief object is to apply to weather prediction Mr. Demchinsky's theory that the moon is the chief factor in meteorological changes.

A LIST of the birds of the Bristol district is given in the volume of *Proceedings* of the Bristol Naturalists' Society (vol. ix. part 2) just published. Other papers are on a Rhætic section at Redland—a suburb of Bristol, by Mr. W. H. Wickes, with additional observations on the beds, by Mr. J. Parsons, and on Triassic deposits at Emborough, by Prof. Lloyd Morgan, F.R.S., and Mr. S. H. Reynolds.

THE second part of the report on a bathymetrical survey of the fresh-water lochs of Scotland, by Sir John Murray, K.C.B., F.R.S., and the late Mr. Fred P. Pullar, appears in the March number of the *Geographical Journal*. An account of the first part of the survey was given in *NATURE* of May 17, 1900 (vol. lxix. p. 65). The second part treats of the remaining lochs of the drainage basin of the Forth, viz., Loch Chon, with Lochan Dubh, Loch Ard, and Lake of Mentieth in Perthshire, and Loch Leven in Kinross-shire. The same number of the *Journal* contains a report of the special meeting held to commemorate the progress of geographical discovery during the Victorian reign.

THE general appendix to the annual report of the Smithsonian Institution for 1898, which has just been received, consists of

reprints and translations of thirty-six papers of wide scientific interest. Many branches of science are represented by the papers, and the whole collection forms a most interesting and valuable survey of subjects prominently before the scientific world in 1898. Limitations of space prevent us from giving a list of the papers reprinted from various reviews and scientific periodicals, but we are glad to direct attention to the following translations:—Recent progress accomplished by aid of photography in the study of the lunar surface, from a paper by MM. Loewy and Puiseux; the Le Sage theory of gravitation, translated from a paper by M. Prevost, with introductory note by Dr. S. P. Langley; the extreme infra-red radiations, by Dr. C. E. Guillaume; the perception of light and colour, by M. G. Lechalas; progress in colour photography, by M. G. H. Niewen-głowski; oceanography, by M. J. Thoulet; the relation of plant physiology to the other sciences, by Dr. Julius Wiesner; *Pithecanthropus erectus*—a form from the ancestral stock of mankind, by Dr. E. Dubois; our present knowledge of the origin of man, by Prof. E. Haeckel; the laws of orientation among animals, by Captain G. Reynaud; the theory of energy and the living world—the physiology of alimentation, by M. A. Dastre; a sketch of Babylonian society, by Herr F. E. Peiser; the excavations of Carthage, by M. P. Berger; the origin of African civilisations, by Dr. L. Frobenius; dogs and savages, by Dr. B. Langkavel; the life and works of Brown-Séquard, by M. Berthelot. It will be seen from this list that the volume contains no less than sixteen translations of papers on important subjects. By publishing these translations, with the reprints, the Smithsonian Institution records the progress of scientific thought in a most serviceable way, and enlarges the outlook of men of science who do not read German and French with facility.

THE discovery of the organo-metallic compounds nearly half a century ago, by Frankland, opened up a wide field of organic synthesis, which has for some time been regarded as exhausted. It has, however, been recently shown by M. Grignard that many syntheses which are effected only with difficulty with the zinc alkyls can be carried out with great ease with magnesium compounds. In the current number of the *Comptes rendus* M. Grignard gives a *résumé* of his work in this direction, together with a theoretical study of the reaction. By the action of magnesium upon an alkyl iodide the compound RMgI is first formed, and this condenses readily with aldehydes and ketones, without there being any necessity to isolate the organo-metallic compound, giving ultimately secondary or tertiary alcohols, the yields being as high as 50 per cent.

THE additions to the Zoological Society's Gardens during the past week include a Pardine Genet (*Genetta pardina*) from West Africa, presented by Lady Moor; a Common Otter (*Lutra vulgaris*), British, presented by Mr. W. Radcliffe Saunders; a Yak (*Poephagus grunniens*) from Tibet, presented by Mr. A. E. Pitt-Rivers; a Blue Whistling Thrush (*Myiophonus coerulesus*) from the Himalayas, a Jerdon's Green Bulbul (*Chloropsis jerdoni*), a Black-crested Yellow Bulbul (*Otocampsa flaviventris*), two Blyth's Hill Partridges (*Arboricola rufigularis*), an Indian Green Barbet (*Therecieryx seylonicus*) from India, a Great Barbet (*Megalæma virens*) from China, presented by Mr. E. W. Harper; a Grey-backed White-eye (*Zosterops dorsalis*) from Australia, presented by Mr. D. Seth-Smith; a Buzzard (*Buteo vulgaris*), European, presented by Mr. J. A. Harvie Brown; a Black Kite (*Milvus migrans*), European, presented by Mr. H. Wreford; a Red Kangaroo (*Macropus rufus*) from Australia, two Striated Jay Thrushes (*Grammatoptila striata*) from the Himalayas, two Rufous-chinned Laughing Thrushes (*Ianthocincla rufigularis*), a Rat Snake (*Zamenis mucosus*) from India, deposited; a Black-faced Kangaroo (*Macropus melanops*) from Tasmania, a Barraband's Parrakeet (*Polytelis barrabandi*) from Australia, purchased.

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OUR ASTRONOMICAL COLUMN.

NOVA PERSEI.—The position of the star, as given by the meridian circle at Greenwich, is

$$\begin{array}{rcl} \text{R.A.} & = & \begin{array}{c} \text{h. m. s.} \\ 3 \quad 24 \quad 28.21 \end{array} \\ \text{Decl.} & = & + 43^{\circ} 33' 54''.8 \end{array} \quad (1901).$$

During the fortnight since its discovery the star has undergone a remarkable series of changes both in brightness and spectrum.

Variation in Brightness.

	Mag.		Mag.		Mag.
Feb. 22	2.7	Feb. 28	2.1	March 6	2.9
23	0.10	March 1	2.2	7	3.0
24	0.65	2	2.3	8	3.2
25	1.0	3	2.4	9	3.5
26	1.1	4	2.6	10	3.7
27	1.5-2.1	5	2.7	11	3.9

In the current issue of *Comptes rendus* (vol. cxxxii. pp. 535-538) M. H. Deslandres describes his observations on the spectrum made with the spectroscope designed for line of sight measures at the Meudon Observatory. The photograph of the star's spectrum was obtained alongside a comparison showing the lines of iron, calcium, hydrogen, helium and air.

After noting the great breadth of the bright lines, he states that the middle of each band is displaced towards the red with respect to the terrestrial spectrum. The spectrum is similar to Nova Aurigæ, but the lines are broader. He then draws attention to the minute structure of the H β (F) line of hydrogen, which shows three maxima of brightness, the more refrangible component being the most intense. The other lines show similar structure, but not so clearly.

On the other hand, the calcium lines at H and K each show a fine, clear, dark line, the only sharp lines in the spectrum; both are displaced slightly towards the red. M. Deslandres discusses the two explanations of the width of the lines, that of Doppler-Fizeau ascribing the appearance to motion, the other, suggested by the experiments of Humphrey and Mohler, and Wilsing, indicating the cause to be the great pressure to which the gases are probably subjected. He concludes by ascribing the group of lines immediately less refrangible than H β to magnesium and asterium, but these have been traced by other observers to the most prominent enhanced lines of iron.

CO-OPERATION IN OBSERVING VARIABLE STARS.—Circular 53 of the Harvard College Observatory consists of an outline plan drawn up by the Director, Prof. E. C. Pickering, for enabling a systematic investigation of variable stars to be made by the cooperation of observers in various localities. This has been induced by the fact that the number of long-period variables is now so great that many of them are neglected.

In the case of variables of small range the difficulty is not so great, as the variation is in most cases regular, but many of the variables of long period appear to change irregularly, and continuous observations are required until the nature of the changes are known. Moreover, the range is, in many cases, so great that the errors of observation are not sufficient to affect seriously the form of the curve.

It is recommended that in the vicinity of each variable a series of about twelve comparison stars be selected, the brightest being slightly brighter than the variable at maximum, and the faintest fainter than the variable at minimum. The intermediate ones should gradually decrease in brightness with about half-a-magnitude differences.

The actual magnitudes of all such stars brighter than the seventh magnitude can be supplied from the meridian photometer records, and means are now being adopted for furnishing on a uniform scale the brightness of the faintest stars likely to be visible in any telescope. At least one observation of each star should be made every month.

For searching out comparison stars the excellent charts of Father Hagen are recommended for stars fainter than the ninth magnitude. For brighter ones copies have been made of the Bonn Durchmusterung charts, giving 3° square about each variable, and these will be supplied to experienced observers willing to co-operate in the work. A list of seventy-three variables for which these charts will soon be ready is furnished.

DIMENSIONS OF THE SATURNIAN SYSTEM.—Prof. T. J. J. See has recently completed a long series of measures of the